Lecture Module - Electrical Signals

ME3023 - Measurements in Mechanical Systems

Mechanical Engineering

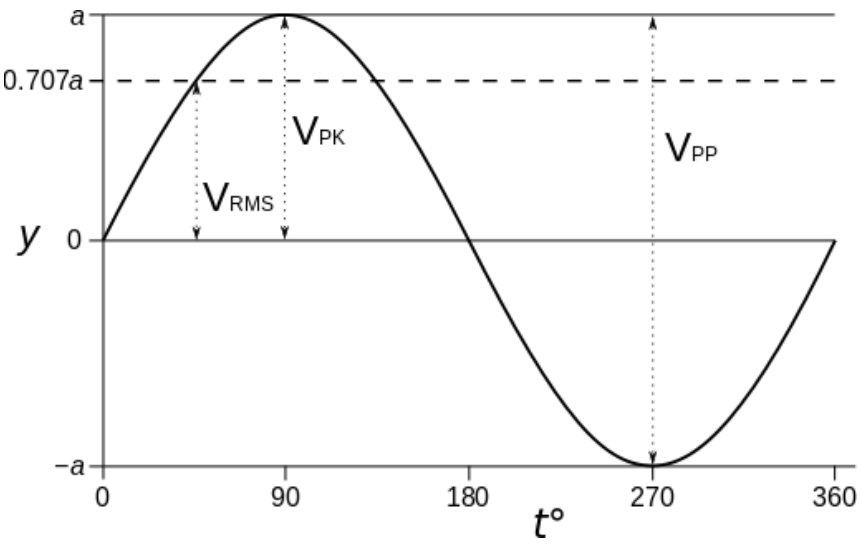
Tennessee Technological University

Topic 2 - Signal Analysis

Topic 2 - Signal Analysis

- Signal Mean Value
- Power Dissipation
- Signal Root Mean Square (RMS) Value
- Discrete-Time or Digital Signals

Signal Mean Value



Mean Value

$$\bar{y} \equiv \frac{\int_{t_1}^{t_2} y(t)dt}{\int_{t_1}^{t_2} dt}$$

Text: Theory and Design for Mechanical Measurements

Power Dissipation

Dissipation - Time Rate of Energy Dissipation

$$P = I^2 R$$

Total Electrical Energy

$$E = \int_{t_1}^{t_2} P dt = \int_{t_1}^{t_2} [I(t)]^2 R dt$$

Power Dissipation

Signal Root Mean Square (RMS) Value

Discrete-Time or Digital Signals

Discrete-Time or Digital Signals

Table 2.1 : Theory and Design for Mechanical Measurements